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19. ABSTRACT (Continue on reverse if necessary and identify by block number) The 1987 Gordon Conference on Corrosion was held at Colby-Sawyer College, New London, N. H. during the week of July 19 to 24. The conference program (attached) covered a cross-section of important areas in the field of high temperature corrosion: transport in oxide films, microchemical analysis of oxide films, stresses in oxide films and films adherence, effects of erosion and applied stresses on oxidation, hot corrosion, oxidation of titanium and the refractory metals, and oxidation of silicon and silicon-containing alloys. In addition to the lectures a significant number of poster papers (list attached) were also presented.					
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SUMMARY OF THE
1987 GORDON RESEARCH CONFERENCE ON CORROSION

→ The 1987 Gordon Research Conference on Corrosion was held at Colby-Sawyer College, New London, N.H. during the week of July 19 to 24.

The budget for the Conference totalled \$22,800 of which \$10,800 was provided by the Board of Trustees of the Gordon Research Conferences and \$3,000 each was provided by the Office of Naval Research, Air Force Office of Scientific Research, Electric Power Research Institute, and U.S. Department of Energy (Fossil Energy Program). (Direct support to graduate students from the UK was also provided by The Institute of Metals).

The funds were used to assist speakers, discussion leaders, graduate students, and a number of experts from the U.S. and overseas with their travel expenses and/or fixed Conference Fee. Without supplementary funds many research scientists would not have been able to attend and the grants from ONR, AFOSR, EPRI and DOE are gratefully acknowledged.

The conference program (attached) covered a cross-section of important areas in the field of high temperature corrosion: transport in oxide films, microchemical analysis of oxide films, stresses in oxide films and film adherence, effects of erosion and applied stresses on oxidation, hot corrosion, oxidation of titanium and the refractory metals, and oxidation of silicon and silicon-containing alloys. In addition to the lectures a significant number of poster papers (list attached) were also presented. Most of these posters were prepared by graduate students.

↑ The conference had 119 participants with 90 coming from the U.S. and 29 from 7 other countries. A copy of the Registration List is attached.

The discussions following each formal presentation and regarding the poster presentations were spirited and many attendees commented on the value they derived from the Conference. It was a pleasure to organize the 1987 Gordon Conference on Corrosion.

G. H. Meier

G. H. Meier

Chairman, 1987 Gordon Conference on Corrosion

November 12, 1987

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GORDON RESEARCH CONFERENCES
CORROSION

July 20-24, 1987
Colby-Sawyer College, New London, NH

Gerald H. Meier, Chairman
David J. Duquette, Vice Chairman

Monday, July 20 (Morn.)

Transport in Oxides

Discussion Leader:

D. J. Duquette
RPI

"Transport in Oxide Films"

A. Atkinson
AERE, Harwell
England

"Cation Grain Boundary Transport
in Cr_2O_3 and Y-doped Cr_2O_3 "

W. E. King and J. H. Park
Argonne National Lab.

Monday, July 20 (Eve.)

Microchemical Analysis of Oxide Films

Discussion Leader:

W. W. Smeltzer
McMaster University
Canada

"Effects of the Segregation of
Impurities at Oxide Grain
Boundaries on Oxidation
Mechanisms

G. J. Yurek and
K. Przybylski
MIT

"Chemical Analysis of Oxide
Scales Using Electron Energy
Loss Microscopy"

M. J. Graham and
D. F. Mitchell
National Research Council
Canada

Tuesday, July 21 (Morn.)

Stress in Oxide Films

Discussion Leader:

G. C. Wood
UMIST
England

"Growth Stress Generation in
Oxide Scales Growing by
Cation Diffusion"

B. Pieraggi
ENSCT
France

"Stress in Oxide Films"

D. Shores
University of Minnesota

GORDON RESEARCH CONFERENCES
CORROSION

July 20-24, 1987
Colby-Sawyer College, New London, NH

Tuesday, July 21 (Eve.)

Adherence of Oxide Films

Discussion Leader:

J. G. Smeggil

"Chemical Bonding Aspects of
 Al_2O_3 Scale Adhesion"

J. L. Smialek
NASA - Lewis

"Effects of Segregation and
Stress on Scale Adhesion"

K. Luthra and C. L. Briant
G. E. Corporate R. & D.

Wednesday, July 22 (Morn.)

External Mechanical Effects on Oxidation

Discussion Leader:

J. F. Stringer
EPRI

"Behavior of Oxide Scales Under
Isothermal LCF and Under
Thermal Cycling Conditions"

M. Schütze
DECHEMA
West Germany

"Interaction Between the Erosion
and Corrosion of Metals
at High Temperatures"

N. Birks
University of Pittsburgh

Wednesday, July 22 (Eve.)

Hot Corrosion

Discussion Leader:

F. S. Pettit
University of Pittsburgh

"Chemistry and Electrochemistry
of Hot Corrosion"

R. A. Rapp
Ohio State University

"Mechanisms of Vanadate-
Induced Hot Corrosion"

M. Seiersten
Center for Industrial Res.
and P. Kofstad
University of Oslo
Norway

GORDON RESEARCH CONFERENCES
CORROSION

July 20-24, 1987
Colby-Sawyer College, New London, NH

Thursday, July 23 (Morn.)

Oxidation of Titanium and
the Refractory Metals

Discussion Leader:

D. L. Douglass
UCLA

"High Temperature Oxidation
of Titanium Alloys"

C. Coddet
University of Compiegne
France

PANEL DISCUSSION: "What is the
Potential for Improved Oxidation
Oxidation Resistance of Refractory
Metal Alloys?"

J. Morral
University of Connecticut
R. A. Perkins
Lockheed Palo Alto Res Lab
R. Svedberg
Westinghouse Advanced
Energy Systems Division

Thursday, July 23 (Eve.)

Oxidation Phenomena Associated
With Microelectronic Devices

Discussion Leader:

R. P. Frankenthal
A.T.&T. Bell Labs.

"Oxidation of Si"

E. A. Irene
Univ. of North Carolina

"Oxidation of Silicides"

S. P. Murarka
R.P.I.

Friday, July 24 (Morn.)

High Temperature Oxidation of
Si-Containing Alloys

Discussion Leader:

J. B. Wagner, Jr.
Arizona State Univ.

"The Effect of Si on the
Oxidation of Fe-Cr Alloys"

F. H. Stott
UMIST
England

"Silica - How Effective is the
Third of the Triumvirate?"

M. J. Bennett
AERE, Harwell
England

GORDON RESEARCH CONFERENCES

CORROSION

TENTATIVE LIST OF POSTER PAPERS

- K. A. Allison and W. W. Smeltzer: "Growth of Oxide Films on Ni-Co Alloys"
- J. Caola, G. H. Meier, and F. S. Pettit: "The Microstructural Characteristics of a CoCrAlY Overlay Coating during the Initial Stages of Hot Corrosion"
- R. Cerchiara, F. S. Pettit, and G. H. Meier: "Corrosion in $\text{SO}_2/\text{O}_2/\text{SO}_3$ Mixtures"
- S. L. Chang, D. M. Rishel, N. Birks, and F. S. Pettit: "Interactions between Erosion and Corrosion Processes at Elevated Temperatures"
- J. L. Corkum and W. W. Smeltzer: "Influence of Si on the High Temperature Oxidation of Fe-Al-Si Alloys"
- C. M. Cotell and G. J. Yurek: "Effects of Yttrium on the Growth Mechanisms of Cr_2O_3 Films at High Temperatures"
- J. K. Doychak: "The Development of Alumina Scales on NiAl Alloys"
- J. Eldridge: "The Oxidation of Aluminum"
- J. Glascott and D. G. Lees: "The Effect of Hydrogen Annealing on Oxide/Metal Adhesion"
- P. Y. Hou and J. Stringer: "Ion Implantation Effects on Cr_2O_3 Growth"
- S. Y. Hwang, G. H. Meier, and F. S. Pettit: "The Low Temperature Hot Corrosion of CoCrAlY - Effects of pSO_3 and Temperature"
- G. M. Kim, E. A. Gulbransen, and G. H. Meier: "Corrosion of Ferrous Alloys"
- Y. K. Kim, and G. J. Yurek: "Segregation of Sulfur to Grain Boundaries in Cr_2O_3 Films Formed on Fe-Cr Alloys"
- D. Larsen: "Parabolic Rate Constants for NiO Growth at Intermediate Temperatures"
- D. G. Lees, P. C. Rowlands, and A. Brown: "The Use of Scanning SIMS to Study Oxide Growth Mechanisms"
- M. Maloney and G. J. Yurek: "Oxidation Resistance of Novel Rapidly Solidified Alloys"
- K. F. McCarthy, J. C. Hamilton, and W. E. King: "Oxidation of Fe-Cr Alloys; In-situ Phase Identification"

- G. H. Meier, F. S. Pettit, A. Ashary, G. M. Kim, and J. Caola:
"Oxidation of FeCrAl Alloys Containing Oxygen-Active
Elements"
- K. Przybylski, S. Basu, and G. J. Yurek: "High Temperature Oxidation
and Oxidation/Sulfidation of Rapidly Solidified Stainless
Steel"
- K. Przybylski and G. J. Yurek: "Mechanisms of the Oxidation of
Commercial Oxide-Dispersion-Strengthened Alloys"
- J. Schaeffer: "Diffusion Aluminides"
- J. Shen: "Rare-Earth Effects in Oxidation"
- J. Smialek: "Effects of Sulfur Content on Scale Adhesion"
- J. B. Wilkinson, D. G. Lees, and S. Brooks: "A SIMS Study of the Growth
Mechanism of Chromia at 950°C"

GORDON RESEARCH CONFERENCES

Corrosion

July 19 - 24, 1987

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